

REMARKS

Due to the length of the specification herein, Applicants will cite to the paragraph number of the published patent application (PG Pub) of the present application, i.e., US 2004/0229464, when discussing the application description, rather than to page and line of the specification as filed.

Applicants thank the Examiner for the courtesy extended to Applicants' attorney and coinventor Dr. Geoffrey Alan Scarsbrook during the interview held July 30, 2008, in the above-identified application. During the interview, Dr. Scarsbrook provided an overview of the technology of single crystal diamond chemical vapor deposition (CVD) technology and particularly how parameters such as control of substrate preparation, as described in the specification herein at paragraph [0060], and level of nitrogen in the gas phase of the CVD process, affects the properties of the single crystal CVD diamond produced. The discussion is summarized and expanded upon below.

The rejection of Claims 1-55, 57-61 and 75-77 under 35 U.S.C. § 102(e) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over, US 6,582,513 (Linares et al), is respectfully traversed.

In response to Applicants' arguments in the previous response why Linares et al neither anticipates nor otherwise renders the present claims unpatentable, the Examiner finds the arguments not persuasive in view of disclosure in Linares et al which the Examiner finds "col. 6 and 9 teach high purity and low nitrogen."

In reply, as Dr. Scarsbrook explained during the above-referenced interview, and further explained in the newly-submitted Scarsbrook Declaration, the terms "high purity" and, in effect, "low nitrogen" are highly subjective and in essence meaningless. The Examiner is particularly directed to paragraphs 22-33 for a detailed explanation of why the

present claims are patentable over Linares et al. Accordingly, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 1-55, 57-61 and 75-77 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over, US 5,443,032 (Vichr et al), is respectfully traversed.

In response to Applicants' arguments in the previous response why Vichr et al neither anticipates nor otherwise renders the present claims unpatentable, the Examiner finds the arguments not persuasive, finding that Vichr et al "col. 6 bottom seeks to avoid nitrogen. Claim 58 translates to roughly 1 ppm nitrogen, not 300 ppb (given a density of 3.5 g/cc). Note claim 59 - the claims are not really limited to what is argued. The argument of process steps is not persuasive, since the process is not elected. The fact that [Vichr et al] unites diamonds is not persuasive, this is not excluded by the claims. The references teach good purity and excellent structure; applicant should show a difference. The argument as to state of the art in 1992 or 1994 is not persuasive; it is what was known to one of ordinary skill in at the time of applicants invention (ie, filing date)."

In reply, the Examiner has correct that Vichr et al seeks to exclude nitrogen, as Dr. Scarsbrook explain at paragraph 35 of the Scarsbrook Declaration. But as Dr. Scarsbrook also explains therein, the present invention does not exclude nitrogen but limits it to within a relatively small amount range. Nor is the Examiner's reference to Claims 58 and 59 relevant, since the amounts recited therein are with respect to the diamond material, not the gaseous atmosphere from which the CVD single crystal diamond is obtained. The process in which the presently-claimed CVD single crystal diamond is obtainable is relevant because, as Dr. Scarsbrook declares, the material obtained is not obtainable in an atmosphere of too low, or too high, an amount of nitrogen. Regarding "good" purity and "excellent" structure, Dr. Scarsbrook explains why such terms as quoted are meaningless. Finally, while the date of a

prior art reference is not by itself disqualifying as relevant prior art, the point of referring to 1992 and 1994 in the previous response was simply to highlight what was known in the art at that time, which was simply very little about the significance and influence of nitrogen in CVD diamond.

The Examiner is particularly directed to paragraphs 34-38 for a detailed explanation of why the present claims are patentable over Vichr et al. Accordingly, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 1-51, 53-55, 57-61 and 75-77 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over, JP 7-277890 (JP '890), is respectfully traversed.

As Dr. Scarsbrook states at paragraph 39 of the Scarsbrook Declaration, "JP '890 describes a method for the production of 'high quality' single crystal diamond using a synthesis environment which contains between about 3 ppm and 1000 ppm of nitrogen. In the context of this application 'high quality' refers only to the level of optical absorption and even this is only characterized by the colour of the diamond layer. There is no reference to the birefringence being less than a particular level. Further there is no indication in JP '890 that any particular process was used to select or prepare the substrates prior to synthesis of the diamond layer, and therefore the person skilled in the art would assume that no special precautions or preparations were required."

Indeed, as previously pointed out, terms such as "high quality" are essentially meaningless when not considered in context. JP '890 prefers 30 to 300 ppm of nitrogen and thus, it is clear that JP '890 evinces no appreciation for the results obtainable when the nitrogen content is no greater than 5 ppm. Indeed, the type of "high quality" disclosed in JP '890 has no relation to the diamond material of the present invention. Nor does JP '890

disclose anything about substrate preparation, which Applicants have previously explained, such as in the previous response, affects the properties of the final product.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

The rejection of Claims 1-51, 53-55, 57-61 and 75-77 under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as obvious over, Michler et al, *Complementary application of electron microscopy and micro-Raman spectroscopy for microstructure, stress, and bonding defect investigation of heteroepitaxial chemical vapor deposited diamond films*, J. Appl. Phys., Vol. 83, No. 1, 187-197 (1998) (Michler et al), is respectfully traversed.

The Examiner finds that Michler et al teaches “excellent crystallinity and no long-range defects,” and acknowledges no disclosure of a nitrogen content.

In reply, while the Scarsbrook Declaration does not address the specifics of the disclosure in Michler et al *per se*, it does explain why terms such as “excellent” are essentially meaningless. Note that Michler et al is drawn to a study of heteroepitaxial diamond layers. Note further that the CVD diamond films were produced in a gaseous atmosphere with no mention of nitrogen (page 188, left column, first full paragraph). These differences alone are sufficient to demonstrate that the presently-claimed diamond material is different from, and not suggested by, the heteroepitaxial diamond-deposited material of Michler et al. Accordingly, it is respectfully requested that this rejection be withdrawn.

Regarding the Examiner’s reference to correcting or resubmitting the Information Disclosure Statement (IDS) filed January 8, 2008 (first IDS) in order to show dates of all the references, **submitted herewith** is another IDS, which includes documents listed as AU and AV on the Form PTO 1449 for the first IDS but with the applicable dates listed on the new Form PTO 1449, and both the Japanese text, English abstract, and English machine translation of document AJ on the Form PTO 1449 for the first IDS. The Examiner is

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respectfully requested to initial the Form PTO 1449 submitted herewith, and include a copy thereof with the next Office communication.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

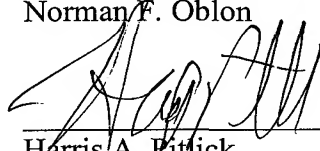
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Respectfully submitted,

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A handwritten signature in black ink, appearing to read 'Harris A. Pitlick', is written over a horizontal line.

Harris A. Pitlick

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